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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/594,150

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Dieter Junger

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EXAMINER

HOGAN, JAMES SEAN

ART UNIT

PAPER NUMBER

3752

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PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/594,150	Applicant(s) JUNGER ET AL.	
	Examiner JAMES S. HOGAN	Art Unit 3752	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 25 September 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 19-39 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 19-23, 25, 28, 30 and 32-35 is/are rejected.
- 7) ☒ Claim(s) 24, 26, 27, 29, 31 and 36-39 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 25 September 2006 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>9/25/06</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Specification

1. The abstract of the disclosure is objected to because it improperly identifies the outer valve needle in line 4 as item (20), and should be item (15), if identified at all.

Correction is required. See MPEP § 608.01(b).

Claim Rejections - 35 USC § 102

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 19-21, 32, 33 and 35 are rejected under 35 U.S.C. 102(b) as being anticipated by U.S. Patent No. 7,051,958 to Potz et al.
3. As per claim 19, Potz et al discloses, by way of Figures 1-3, a fuel injection valve having an outer valve needle (2) which by means of a longitudinal motion cooperates with a valve seat (24) for opening and closing at least one outer injection opening an inner valve needle (22) disposed in the outer valve needle and which by means of its longitudinal motion cooperates with a valve seat (the same (24)) for opening and closing at least one inner injection opening a control chamber (52) which can be filled with fuel under pressure, the fuel pressure acting on the outer valve needle and the inner valve needle in such a way that as a result, a closing force in the direction of the valve seat is exerted on the inner valve needle and the outer valve needle (by way of chamber (50) and an inflow chamber (16) which at least partly surrounds the outer valve needle and can be filled with fuel under pressure, the improvement wherein an opening force oriented counter to the closing force is applied to both the inner valve needle and the outer valve needle by means of the fuel pressure in the inflow chamber, done when the

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outer needle is moved in the opposing force and then the inner needle soon after. with fuel.

4. As per claim 20, the longitudinal borer (21) acts as an intermediate chamber between the outer valve needle and the inner valve needle and is hydraulically connected to the inflow chamber (16).

5. As per claim 21, the inner valve needle has an inner pressure face (38) which is subjected by pressure in the intermediate chamber.

6. As per claim 32, the valve seat (24) is embodied substantially conically, wherein at least one outer injection opening (130) and one inner injection opening (230) originate at the valve seat, and wherein the outer valve needle controls the outer injection openings, and the inner valve needle controls the inner injection openings.

7. As per claim 33, the outer valve sealing face on the outer valve needle is shaped such that upon contact of the outer valve needle with the valve seat the outer injection openings are sealed off both upstream and downstream.

8. As per claim 35, the injector of Potz et al has an inflow throttle (70) providing fluid communication between the control chamber (52) and an inflow conduit (10), and an outflow conduit (10) providing fluid communication between the control chamber and an implied fuel tank, and a control valve (46) disposed in the outflow conduit and operable to open or close the outflow conduit.

Claim Rejections - 35 USC § 103

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9. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

10. Claims 22, 23, 25, 26, 28, 30, and 34 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 7,051,958 to Potz et al. in view of U.S. Patent No. 5,889,389 to Pataki et al.

11. The rejection of claim 19 above serves as the basis for the following.

12. As per claim 22, Potz et al teaches all the limitations of the claims except for a connecting bore between an outer needle and an inner needle . However, Pataki et al discloses a connecting bore (54) in an outer valve needle (12) establishing communication of an intermediate chamber with the inflow chamber. Therefore, it would have been obvious to one having ordinary skill in the art to have provided the device of Potz et al with a bore hole as suggested by Pataki et al Doing so would provide fluid communication between the two needles and because (a) the Potz et al reference and the Pataki et al references are *known work in one of field of endeavor*, (b) such modification is merely the use of known technique to improve a similar device by Applicant and (c) such modification, i.e. choosing from a finite number of predictable solutions, is not of innovation but of ordinary skill and common sense. *KSR, International Co. v. Teleflex Inc., 550 U.S. (2007)*.

13. Similarly, as per claims, 23 and 25 Potz et al does not teach a shoulder on the inside of the outer valve needed to correspond with one on the inner needle. Pataki

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teaches a shoulder (40) on the inside of the outer valve needle (12) opposite the inner pressure face (82) of the inner valve needle (48), and which is axially spaced apart from the inner pressure face upon contact of the inner valve needle and the outer valve needle with the valve seat, with the inner valve needle, after lifting from the valve seat and after executing an opening stroke, moves into an opening position and with its face end (See Figure 1) comes into contact with a fixed stop, and wherein the shoulder of the outer valve needle in its opening stroke comes into contact with the inner pressure face (82). Therefore, it would have been obvious to one having ordinary skill in the art to have provided the device of Potz et al with a corresponding needle shapes as suggested by Pataki et al Doing so would provide better communicative movement of the needles and because (a) the Potz et al reference and the Pataki et al references are *known work in one of field of endeavor*, (b) such modification is merely the use of known technique to improve a similar device by Applicant and (c) such modification, i.e. choosing from a finite number of predictable solutions, is not of innovation but of ordinary skill and common sense. *KSR, International Co. v. Teleflex Inc.*, 550 U.S. (2007).

14. As per claim 26, and 28 Potz does not teach a shoulder of an inner valve urging an outer valve closed. The inner valve needle as taught by Pataki et al, in its closing motion toward a valve seat moves the opened outer valve needle in the closing direction by means of contact with the shoulder (84). It would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the

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injector of Potz et al with the needles of Pataki et al in order to have better communicative movement between valve needles.

15. As per claim 30, as in claim 35 outlined above, the injector of Potz et al has an inflow throttle (70) providing fluid communication between the control chamber (52) and an inflow conduit (10), and an outflow conduit (10) providing fluid communication between the control chamber and an implied fuel tank, and a control valve (46) disposed in the outflow conduit and operable to open or close the outflow conduit

16. As per claim 34, on the injector of Potz et al, does not teach the outer valve sealing face on the outer valve needle outer sealing edge and an inner sealing edge sealing off in both flow directions. Pataki teaches outer valve sealing face (42) on the outer valve needle comprises an outer sealing edge and an inner sealing edge, of which the outer sealing edge comes into contact with the valve seat upstream of the outer injection openings and the inner sealing edge comes into contact with the valve seat downstream of the outer injection openings whereby the outer injection openings are sealed off in both flow directions. It would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the injector of Potz et al with the needles of Pataki et al in order to have less leakage from the outer needle face.

Allowable Subject Matter

17. Claims 24, 26, 27, 29, 31 and 36-39 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Conclusion

18. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure is as follows

U.S. Patent No. 7,117,842 to Boeland et al

U.S. Patent No. 6,769,634 to Brenk et al.

U.S. Patent No. 6,901, 915 to Winter et al

U.S. Patent No. 7,021,567 to Potz et al

Any inquiry concerning this communication or earlier communications from the examiner should be directed to JAMES S. HOGAN whose telephone number is (571)272-4902. The examiner can normally be reached on Mon-Fri, 6:00a-3:00p EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Len Tran can be reached on (571)272-1184. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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/J. S. H./
Examiner, Art Unit 3752

/Len Tran/
Supervisory Patent Examiner, Art Unit 3752